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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/666,742
Filing Date: September 19, 2003
Appellant(s): WOOD ET AL.

Brick G. Power
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed April 10, 2006 appealing from the Office action mailed January 30, 2006.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

This appeal involves claims 17-21, 23-27 and 30-34.

Claims 22, 28 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The rejection of Claims 22, 28 and 29 is withdrawn in view of Applicants' arguments.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,869,354	**LEEDY**	**2-1999**
6,562,661	**GRIGG**	**5-2003**

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

I. Claims 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Leedy et al (US 5,869,354).

The afore mentioned claims generally require a method for thinning a semiconductor substrate comprising forming a support structure on an active surface of

the semiconductor substrate, removing material from a back side of the semiconductor substrate to form a thinned semiconductor substrate; and transporting the thinned substrate for further processing.

Leedy et al disclose a method of making a dielectrically isolated integrated circuit. Leedy et al disclose the step of attaching an annular support ring to an edge portion of a semiconductor substrate on a principal side, and thinning the backside of the semiconductor substrate, as required by present claims 17-19. See column 7, line 50 to column 8, line 15, column 44, lines 35-50 and column 45, lines 1-5. Leedy et al also discloses the use of a package as required by present Claim 20. See the Abstract and Figures 16A –16B. As Leedy et al disclose multiple chip modules, in other words the need for further processing the thinned substrate, and therefore the limitation "transporting the thinned semiconductor substrate for further processing" is met. See Figures 32A-C for example. Therefore, Claims 17-20 are anticipated by the Leedy reference.

II. Claims 21, 23-27 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leedy et al (US 5,869,354) in view of Grigg (US 6,562,661).

The afore mentioned Claims generally require that the support structure comprises forming a layer comprising unconsolidated material over at least an outer peripheral portion of the active surface; and at least partially consolidating the unconsolidated material within at least outer peripheral regions of the layer.

Leedy et al is relied upon as discussed above.

However, Leedy et al does not disclose forming a layer comprising unconsolidated material over at least an outer peripheral portion of the active surface; and at least partially consolidating the unconsolidated material within at least outer peripheral regions of the layer.

Grigg disclose stiffeners for connective structures that are configured to be secured to a semiconductor device component such as a semiconductor die or substrate by a tape automated bonding process. See the Abstract. Grigg et al disclose forming a layer comprising unconsolidated material over at least an outer peripheral portion of the active surface; and at least partially consolidating the unconsolidated material within at least outer peripheral regions of the layer, as required in present Claims 21-23. See Figure 6, column 7, lines 50-60 and column 16, lines 1-15. Moreover, Grigg et al disclose energy beams as required in Claims 24-25. Furthermore, Grigg et al disclose stereolithographically forming the structure as required by present Claims 26-31. See column 12, line 55 to column 13, line 60.

It would have been obvious for one of ordinary skill in the art, at the time of the invention, to bond the interconnect circuit membrane as disclosed by Leedy et al using the stiffeners as disclosed by Grigg, for their known benefit in fabricating connective structures and to arrive at the presently claimed invention. The use of a known bonding process to fabricate interconnect circuit membranes which are known in the prior art, is *prima facie* obvious. Therefore, the presently claimed limitations are obvious in view of the cited references.

(10) Response to Argument

I. Claims 17-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Leedy et al (US 5,869,354).

Applicants argue that Leedy does not expressly or inherently disclose each and every element. Applicants argue that the description of Leedy is limited to etching the back side 14 of a silicon substrate 10 to remove material therefrom, then after etching, forming a retaining frame (or ring) 18 on the back side. The Examiner maintains that Leedy disclose the step of attaching an annular support ring to an edge portion of a semiconductor substrate on a principal side. See for example Figure 1f, and column 7, lines 48-50, and column 8, lines 48-50 which clearly show that the retaining frame or ring is on both sides of the wafer. Therefore, the Examiner maintains Claims 17-20 are anticipated by the Leedy reference.

Applicants argue that the optional preformed bonding frame 19 of Leedy, which is bonded to the substrate 10, is not *formed on* an active surface of the semiconductor substrate as would be required for Leedy to expressly or inherently describe or anticipate each and every element of independent Claim 17. The Examiner maintains that common dictionary terms for formed are 1) take a definite arrangement or 2) take up a formation next to, which would encompass the phrase "bonded". The Examiner maintains that the claims are read in the broadest reasonable light in view of the

Specification, and in the present case the phrase "formed on" in the present case is anticipated on the disclosure of Leedy et al as relied upon.

With respect to Claim 20, Applicants argue that Leedy does not expressly or inherently disclose a method that includes forming a support structure by forming a layer of packaging material over the active surface and extending radially outward to at least an outer peripheral edge of the semiconductor substrate. The Examiner notes that Leedy discloses the use of a glass ring structure, as disclosed by the present Specification, and therefore anticipates Claim 20. See Leedy, column 8, lines 48-52.

II. Claims 21, 23-27 and 30-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Leedy et al (US 5,869,354) in view of Grigg (US 6,562,661).

Applicants argue that neither Leedy nor Grigg provides any teaching or suggestion that the stiffening elements of Grigg, which merely reinforce or stiffen parts of a flexible substrate as components are being secured thereto, would be useful in a thinning process. The Examiner maintains that Leedy pertains to a thinning process. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Moreover, with respect to the Grigg reference, Applicants argue the deficiencies of the Leedy reference. The Examiner maintains that Leedy discloses a support on the active surface as discussed above. Moreover, the Examiner maintains that it would have been obvious for one of ordinary skill in the art, at the time of the invention, to bond the interconnect circuit membrane as disclosed by Leedy et al using the stiffeners as disclosed by Grigg, for their known benefit in fabricating connective structures and to arrive at the presently claimed invention. The use of a known bonding process to fabricate interconnect circuit membranes which are known in the prior art, is *prima facie* obvious. In response to applicant's argument that the Grigg reference does not provide any teaching or suggestion that it would be useful in a thinning process, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). In the present case, as both prior art references pertain to bonding a *prima facie* case of obviousness is established.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Alexander G. Ghyka

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